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ABSTRACT

This study attempted to examine selected features of principal-teacher behavior in relation to the educational environment of elementary schools. Subtests of Halpin's Organizational Climate Description Questionnaire were used to obtain teacher perceptions of the principal variables of Aloofness, Production, Emphasis, Thrust, and Consideration; and the teacher variables of Disengagement, Hindrance, Esprit, and Intimacy. Collective perceptions of 5th and 6th grade students were obtained on Sinclair and Sadker's Elementary School Environment Survey for educational environment variables of Alienation, Humanism, Autonomy, Morale, Opportunism, and Resources. Usable responses were obtained from 4,105 students and 627 teachers in 36 Massachusetts and Pennsylvania elementary schools. The overall relationship between the behaviors of the school principal and his teachers and the educational environment of sampled schools was tested by means of canonical correlation. Bivariate relationships between teacher-principal variables, educational environment variables, and demographic data variables were tested by the computation of Pearson product-moment correlations. The results of the study support the contention that the behavior of teachers and principals is significantly related to selected components of the educational environment. (Author/DN)

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Principals, Teachers, and Elementary Youth: A Study of the Relationships Between Selected Variables of Teacher-Principal Social Interaction and Six Features of the Educational Environment

Introduction

It has been generally agreed that the school principal is one of the key agents in promoting or retarding educational change (Gross and Herriott, 1965; Lieberman, 1969; Spain, 1956). As the leader of the school, the principal usually has major control over factors including the selection of staff, allocation of teaching responsibilities and the format of the school schedule. An important figure in the alignment of educational priorities, he is instrumental in the implementation of innovative programs at the school. Also, he acts as a controlling force in the extent to which parental and other pressures are brought to bear on teachers. Thus, the principal is seen as one of the most influential forces in determining the extent to which the school is a vibrant or a sterile institution.

Even though the behavior of the school principal seems crucial in shaping such desirable conditions for learning, more research is needed concerning the specific nature of his influence on the educational environment. The intent of the present paper is to report a recent investigation of this relationship in selected elementary schools.

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Purpose of the Study

The purpose of this study was to examine teacher-principal social interaction in relation to the educational environment in selected elementary

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schools. The investigator will describe relationships among selected features of the teacher-principal social interaction and selected components of the existing educational environment in the sampled schools. Also, implications will be drawn for consideration in further research concerning the influence of the principal-staff interaction on the development of educational environments.

Teacher-principal social interaction. Insofar as this study is concerned, the teacher-principal social interaction refers to the "social component" of organizational climate described by Halpin and Croft (1963). In examining the social interactions that occur between the teachers and the principal, the authors included measures of the leader's behavior as well as measures of the group's behavior.

Eight components are included in studying teacher-principal social interaction. These comprise the eight subtests of Halpin's Organizational Climate Description Questionnaire (OCDQ), completed by the teachers in each participating school. The four subtests which describe selected features of teacher behavior are named disengagement, hindrance, esprit, and intimacy. The subtests referring to the principal's behavior are aloofness, production emphasis, thrust, and consideration. A complete description of these factors is included in Appendix A.

Educational environment. As conceptualized by Sinclair and used in this study, the educational environment of the elementary school refers to "the conditions, forces, and external stimuli which foster the development of individual characteristics. The environment is recognized as a complex system of situational determinants that exert an influence upon participating individuals . . . . This conceptualization of environment is based upon the assumption that behavior is a function of the transactional relationship

between the individual and his environment." (1968, p. 3)

Using the preceding rationale, Sinclair developed the Elementary School Environment Survey (ESES). The ESES elicits the responses of fifth and sixth grade students to eighty true/false items representing the variables of practicality, propriety, community, awareness, and scholarship. A revised form of the Elementary School Environment Survey has recently been completed. Using data from fifty-four Massachusetts elementary schools, Sadker (1971) recently employed factor analysis procedures to generate six factor clusters. The six new environmental factors have been named alienation, humanism, autonomy, morale, opportunism, and resources. Appendix B contains a complete description of these variables.

In summary, the eight subtests of the Organizational Climate Description Questionnaire were used to assess the teacher-principal social interaction in selected elementary schools. Furthermore, the educational environment in each school was measured along the six dimensions included in the most recent revision of the Elementary School Environment Survey. Features of the reported educational environment were examined in relation to the components of teacher-principal interaction.

Significance of the Study

There is considerable evidence to indicate that the behavior of the school principal has an effect on certain staff conditions, such as teacher morale and professionalism (Lieberman, 1969; Chesler, 1963; Reynolds, 1965; Gross and Herriott, 1965). Some (Gross and Herriott, 1965, p. 57) even suggest that teachers' professional performance and morale may serve as links between leadership practices of the principal and the academic performance of pupils. Lieberman (1969, p. 18) adds, "Principals and teachers are dependent on each other for the satisfaction of needs whether they be providing materials for

the teacher, satisfactory working conditions, or shared decision-making. The orientation that principals take toward their staff will affect not only the way teachers feel toward the principal and the staff, but also the way they feel toward teaching as a job."

Another important feature of the present study is the manner in which organizational effectiveness is determined. Although it may be necessary for educators to appraise the "output" of the schooling process by gathering achievement test data, grades, reading level scores and college board results, it is becoming quite apparent that other factors may be equally relevant. Modern industrial theorists feel that it is unrealistic to be concerned only with output in assessing organizational effectiveness. Likert (1961, p. 61) suggests that measures of effectiveness must examine another set of variables, called "intervening variables," that reflect the current condition of the internal state of the organization--its loyalty, skills, motivations, and capacity for effective interaction, communication, and decision-making. In addition, Herzberg (1966) contends that it is not enough to foster desirable "hygiene factors" of the work environment such as status, security, salaries, working conditions and interpersonal relationships. These factors produce no growth in worker output capacity; they only prevent losses in worker performance due to work restriction. More study is needed regarding the application of these notions of industrial management to the operation of educational organizations. An additional significance of the present study was the identification and measurement of relevant intervening variables in the elementary school organization.

Different educational environments affect children in different ways, and to ignore variance in school environments is to limit understanding of behavioral differences in students. Also, different principal behavior affects the

school in different ways. To increase our understanding of how the principal's behavior affects the educational environment, it is necessary to identify specific relationships that are significant.

Theoretical Base

In the present study our main interest is the transactional relationship between school principal, his teachers, and the pupils. A useful model of this triadic relationship is provided by Tharpe and Metzel (1969) as they discuss the consultative triad, a special instance of behavior modification theory. The triad is shown in Figure 1.

The consultant position in this model is described as anyone who has knowledge, the mediator role as anyone with the reinforcers, and the target as anyone with the problem. For the present study, this unique transactional relationship may be depicted as shown in Figure 2. Relating this model to the current study, the principal (consultant), through his efforts with teachers (mediator), has effect on the educational environment for pupils (targets).

Figure 1

The Consultative Triad

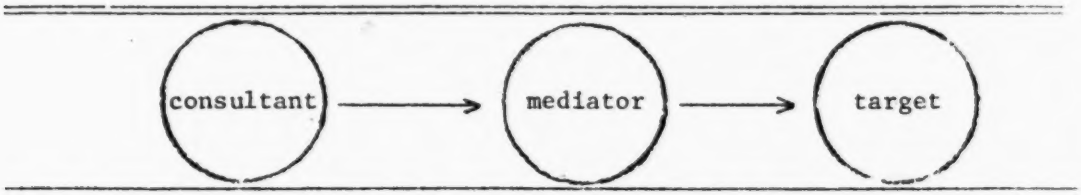
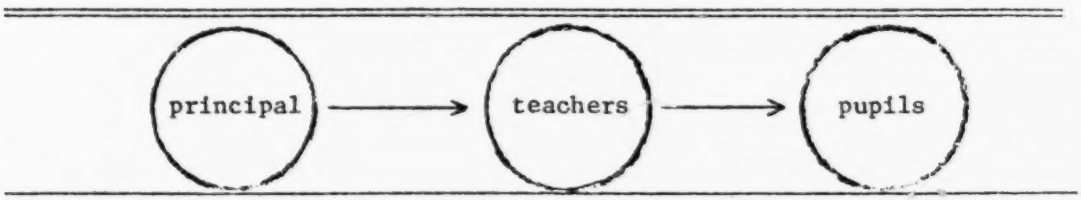


Figure 2

Transactional Triad



Educational Environment. Although educators have for some time been interested in building constructive learning situations, it is only in the past decade or so that significant efforts have been made to identify and measure specific variables in the educational environment. The bulk of this work has been stimulated by Stern and Pace (1958) in their systematic attempt to characterize college environments. Using the collective perceptions of students, the College Characteristics Index (CCI) was constructed to measure the environmental press of colleges. In subsequent work, adaptations of this instrument were developed to measure the environments of both the high school (High School Characteristics Index - HSCI) and the elementary school(Elementary School Characteristics Index - ESCI). In a further analysis, Pace revised the CCI, selecting items which measured most sharply the differences among fifty colleges comprising a normative sample. A new instrument was developed that used about half of the CCI items. The College and University Environment Scales (CUES) was used to obtain ratings in five areas: scholarship, awareness, propriety, community, and practicality. Pace's work was extended significantly as Sinclair (1968) adapted CUES to measure the elementary school environment along the same variables.

Teacher-principal social interaction. As indicated, teacher-principal social interaction refers to the social component of organizational climate, as measured by the Organizational Climate Description Questionnaire. The following four categories of group interaction were considered by Halpin and Croft (1963, p. 16).

1. Interactions determined primarily by the leader's behavior.
2. Behavior attributable to characteristics of the group qua group.
3. Interactions determined by procedures or by actions of an executive in a position hierarchically superior to the leader himself.

4. Interactions determined primarily by the behavior of individuals qua individuals, and hence associated directly with the "personality" assets and liabilities of the individual.

An additional basis used to classify group interaction was the relationship between the social needs of the individual and the social control imposed upon him as a member of a group. As Halpin (1963, p. 17) states, "we knew that . . . we would have to take into account the balance maintained between the satisfaction of individual social needs and the organization's requirements for social control."

By administering the sixty-four item OCDQ to teachers in an elementary school, scores are obtained for each of eight variables. Organizational climate scores are then derived for each school by comparing the obtained subtest scores with a national sample of seventy-one schools. In the current investigation, use of the OCDQ was limited to the procurement of subtest scores.

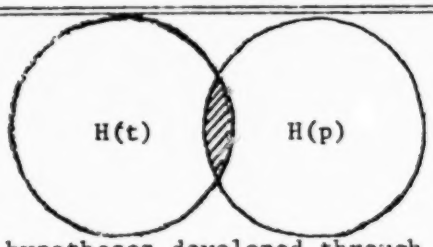
Perceptions and Beta Press. As indicated by Murray in 1938, the environment can be seen as providing a stimulus to which individuals both attend and react. This stimulus situation is described as a "potency" or press, and provides an individual with a perception of the complexities of environment. The same environment can be perceived differently by individuals with different needs. Thus, a person's behavior is determined by the dynamic interaction between his unique needs and the environmental press.

Statement of Hypotheses

Two sets of initial hypotheses were generated. First, existing research was examined for plausible relationships; then, results of a pilot study were analyzed. Two sets of hypotheses were consequently formulated. Figure 3 represents the procedure used to select priority hypotheses for the present study.

Figure 3

Selection of Hypotheses



H(t): Initial hypotheses developed through theoretical base.
H(p): Initial hypotheses developed through pilot study.
▨ - H(t) ∩ H(p): priority hypotheses for the present study.

Priority hypotheses for the present study were those initial hypotheses that were contained in both sets. They were:

H_1: There will be a significant negative relationship between the Aloofness of the principal and Alienation in the educational environment.

H_2: There will be a significant positive relationship between the Thrust of the principal and Morale in the educational environment.

H_3: There will be a significant positive relationship between the Disengagement of the teachers and Alienation in the educational environment.

H_4: There will be a significant positive relationship between the Hindrance of the teachers and Alienation in the educational environment.

H_5: There will be a significant negative relationship between the Disengagement of the teachers and Morale in the educational environment.

A second group of plausible relationships were selected by choosing initial hypotheses from the pilot study for which no previous research inferences were examined. The following initial hypotheses fulfilled requirements.

H_6: There will be a significant positive relationship between the Consideration of the principal and Resources in the educational environment.

H_7: There will be a significant positive relationship between the Thrust of the principal and Resources in the educational environment.

H_8: There will be a significant positive relationship between the Aloofness of the principal and Resources in the educational environment.

H_9: There will be a significant negative relationship between the Intimacy of the teachers and Resources in the educational environment.

H_{10}: There will be a significant negative relationship between the Hindrance of the teachers and Resources in the educational environment.

H_{11}: There will be a significant negative relationship between the Production Emphasis of the principal and Opportunism in the educational environment.

H_{12}: There will be a significant negative relationship between the Disengagement of the teachers and Opportunism in the educational environment.

H_{13}: There will be a significant negative relationship between the Hindrance of the teachers and Humanism in the educational environment.

Other relationships. One of the goals of this study was to refine administrative theory by identifying additional plausible relationships regarding elementary schooling. Campbell and Stanley (1963, p. 64) suggest that the absence of such correlations can rule out many hypotheses. Also, the approach taken here can "provide a preliminary survey of hypotheses, and those which survive this can then be checked through. . . experimental manipulation." In addition, an important part of the present study was to seek discriminating profiles of principal behavior and teacher behavior in relation to various features of the educational environment. The intent of this exploratory procedure was primarily to generate additional hypotheses for future research of a more experimental nature.

Sample

First, a set of initial hypotheses were formulated by identifying gaps in existing research and citing earlier findings that had implications for the present

study. A second set of initial hypotheses were framed after an examination of pilot study data from eight elementary schools. Both sets of initial hypotheses were used to determine priority hypotheses for the present study. The preceding approach was taken so that hypotheses for the present study were given quantitative strength. The detail of this process will not be reported in the present paper, but may found in McKay (1971) or secured by writing the author.

The following criteria were developed to consider all schools for inclusion in the sample.

1. It was necessary for each school to have a full-time principal.
2. It was desirable for the organization of each school to include a range of at least five grade levels.

The final sample consisted of thirty-six schools representing a wide diversity of elementary education. These diverse characteristics included a range of district per-pupil expenditure from $478 to $950, a school enrollment spread from 225 to 860, and schools from city, suburban, and rural municipalities. These and other demographic characteristics are displayed in Table 1. While the sample is in no way to be considered random, it is reasonable to believe that it is widely representative.

Principals of participating schools were contacted and arrangements were made for the collection of data. A date was scheduled for administering the instruments to all fifth and sixth grade pupils and the entire faculty of each school. Pupils were scheduled to complete the ESES-II during the school day in groups usually no larger than sixty. A faculty meeting was arranged for teachers to complete the OCDQ. About thirty minutes was needed for each administration of these instruments. Usable data were received from 4,105 fifth and sixth grade pupils and 627 teachers in 36 elementary schools.

Table 1

SCHOOL DEMOGRAPHIC INFORMATION

CODE NUMBER	TYPE OF SCHOOL	SCHOOL ENROLLMENT	APPROXIMATE SOCIO-ECONOMIC CLASS	NUMBER OF PUPILS IN SCHOOL DISTRICT	PER-PUPIL EXPENDITURE	POPULATION OF MUNICIPALITY	CLASSIFICATION OF MUNICIPALITY[1]
000	1-5	440	Lower Middle	3,738	$478	15,200	City
001	K-6	397	Lower Middle	6,342	$578	40,000	Urban Town
002*	K-8	251	Middle	*	$250*	175,000	City (*Catholic School)
003	K-6	748	Middle	6,910	$528	43,000	City
004	K-6	800	Heterogenous	5,366	$835	13,500	Town
013	K-5	510	Lower Middle	4,699	$716	2,600	Town
014	K-6	433	Upper Middle	2,714	$675	5,400	Town
100	K-5	310	Middle	14,793	$756	62,000	Urban Town
101	K-6	600	Upper Middle	2,714	$675	5,400	Town
102	K-6	380	Middle	386	$612	1,350	Town
103	1-5	723	Lower Middle	4,054	$490	18,000	Urban Town
110	1-6	860	Middle	3,738	$478	15,200	City
112	K-6	323	Middle	18,219	$950	89,000	City
114	1-6	818	Upper Middle	841	$699	1,900	Town
121	1-6	480	Lower Middle	3,561	$515	20,500	Urban Town
200	K-8	435	Middle	*	*	*	*State College Lab School
202	K-6	450	Middle	2,698	$800	2,718	Town
203	4-6	390	Upper Middle	992	$850	8,242	Town
212	K-6	225	Lower Middle	3,332	$600	19,000	City
213	K-6	271	Middle	3,332	$600	19,000	City

[1]According to 1970 Edition of the Commercial Atlas and Marketing Guide, Rand McNally & Company.

Table 1 (Continued)

CODE NUMBER	TYPE OF SCHOOL	SCHOOL ENROLLMENT	APPROXIMATE SOCIO-ECONOMIC CLASS	NUMBER OF PUPILS IN SCHOOL DISTRICT	PER-PUPIL EXPENDITURE	POPULATION OF MUNICIPALITY	CLASSIFICATION OF MUNICIPALITY
300	K-6	465	Upper Middle	7,571	$796	31,200	Urban Town
301	K-6	325	Middle	7,571	$796	31,200	Urban Town
304	K-6	398	Middle	7,571	$796	31,200	Urban Town
311	K-6	489	Middle	7,571	$796	31,200	Urban Town
313	K-6	410	Upper	7,571	$796	31,200	Urban Town
330	1-6	350	Middle	2,984	$550	600	Town
331	K-6	476	Lower Middle	2,984	$550	2,385	Town
332	1-6	345	Middle	2,984	$550	5,000	Town
333	1-6	411	Middle	2,984	$550	5,000	Town
342	K-6	609	Upper Middle	7,571	$796	31,200	Urban Town
343	K-6	345	Upper Middle	7,571	$796	31,200	Urban Town
400	1-5	254	Lower Middle	4,054	$550	18,000	Urban Town
410	K-5	476	Middle	3,187	$517	11,000	Urban Town
411	K-6	547	Upper Middle	5,800	$851	11,000	Town
420	K-5	364	Lower Middle	14,793	$756	62,000	Urban Town
422	K-6	645	Upper Middle	4,396	$890	23,200	Urban Town

Instrumentation

Two questionnaires were used in gathering data. The educational environment of sampled schools was measured by the most recent revision of the Elementary School Environment Survey (ESES). Environment scores were obtained along the dimensions of alienation, humanism, autonomy, morale, opportunism, and resources. The Organizational Climate Description Questionnaire (OCDQ) was used to identify the teacher and principal behavior in each school. The use of the OCDQ was limited to the scores on the eight subtests, which are entitled disengagement, hindrance, esprit, intimacy, aloofness, production emphasis, thrust, and consideration. Each of these instruments will be described in further detail in the remainder of this section.

The Elementary School Environment Survey (ESES - II)

Sadker (1971) recently conducted a factor analytic study of the original ESES, developed by Sinclair (1969). After his analysis, Sadker suggested revisions of the original five environmental variables. The new factors were named alienation, humanism, morale, autonomy, opportunism, and resources. The revised instrument contained forty-two items, including eight that were newly created.

Three approaches were used in order to assess the validity of the present form of the ESES. First, content validity was considered by examining the reactions and comments of pupils regarding specific items on the questionnaire. After administering the instrument in each school, members of the data collection team reviewed problems and questions which were evident. In the view of those who collected data, a few items seemed to generate frequent and considerable misunderstanding among pupils. A threat to content validity exists to the extent that misunderstandings of the meanings of these items

are shared by other pupils who completed the ESES. Four items were subsequently deleted from the analysis in the study.

The construct validity of ESES (II) was assessed by conducting a factor analysis of the data obtained in the present study. As much as possible, the current analysis employed the same factor analytic procedures used by Sadker. Two problems were faced in this attempt. First, the previous analysis involved two separate populations, those students who completed form A of ESES (I), and those who completed form B. These groups were considered by Sadker in separate factor analyses, and the findings were combined to suggest the six new environmental factors. The present factor analysis differs from Sadker's in that data were obtained from a single population of students. A second difference concerns the number of items included in the analysis. In factor analytic studies, it is mathematically desirable to have a sample which is more than twice the size of the instrument. Since this was not possible in the current analysis, spuriously high results may have occurred in the factor loadings. However, as in Sadker's study, an orthogonal axes analysis of the verifax program was performed. The factor matrix derived from this program served as input to a generalized Harris-Kaiser oblique analysis. Factor loadings and communality values were compared to corresponding results obtained by Sadker. These comparisons are displayed in Tables 2 and 3. While the results are not substantial enough to provide overwhelming support for the six environmental factors suggested by Sadker, it is felt that there was sufficient agreement between the two analyses to infer adequate construct validity. Additional validation of this sort seems warranted in future studies specifically directed toward this purpose.

A third approach to validity taken in this study is the determination of the degree of relationship between a defined construct and measures of

other identifiable features of the sampled schools. Since scores for each school are available for the Halpin-Croft OCDQ, relationships between ESES (II) variables and OCDQ variables may be considered in part to bear on the predictive validity of the ESES (II). Since the body of the current study is concerned with just such relationships, they will not be reported at this stage.

According to Pace and Stern (1958, p. 272), it may not be appropriate to obtain conventional reliability estimates for instruments such as ESES. As reported by Pace (1969, pp. 42-43),

> The usual formulas for estimating reliability--test-retest, split-halves, KR formulas, and so forth--are all based on the variance of scores and are not applicable to estimating the reliability of a score at a single school. . . (CUES scores) . . .are based on the logic of consensus, not the logic of variance. Consensus is the opposite of variance.

TABLE 2

Comparison of Communalities*

ITEM	FACTOR I	II	III	IV	V	VI
1	.87 (.84)					
2	.78 (.64)					
3	.83 (.56)					
4	.82 (.73)					
5	.63 (.60)					
6	.84 (.86)					
7	.72 (.72)					
8		.75 (.57)				
9		.62 (.63)				
10		.77 (.57)				
11		.70 (.83)				
12		.60 (.51)				
13		.83 (.65)				
14		.76 (.84)				
15			.76 (.75)			
16			.81 (.75)			
17			.64 (.38)			
18			.68 (.74)			
19			.72 (.74)			
20	(NEW)		-- (.46)			
21	(NEW)		-- (.73)			
22				.81 (.76)		
23				.82 (.66)		
24				.72 (.51)		
25				.82 (.74)		
26				.72 (.87)		
27				.80 (.79)		
28				.63 (.74)		
29					.75 (.40)	
30					.79 (.48)	
31					.74 (.62)	
32	(NEW)				-- (.80)	
33	(NEW)				-- (.55)	
34	(NEW)				-- (.82)	
35	(NEW)				-- (.66)	

*Two communality values are reported for all items except those newly created by Sadker. Values in parentheses are those obtained by the present cross-validation.

Table 2 (Continued)

ITEM	FACTOR I	II	III	IV	V	VI
36						.80 (.40)
37						.69 (.55)
38						.81 (.66)
39						.68 (.70)
40						.58 (.77)
41 (NEW)						-- (.45)
42 (NEW)						-- (.74)

Table 3

Comparison of Factor Loadings*

ITEM	FACTOR I	II	III	IV	V	VI
1	.96 (.86)					
2	.85 (.73)					
3	.76 (.63)					
4	.66					
5	.54					
6	.72 (.89)					
7	.70 (.79)					
8		.77 (.36)				
9		.66 (.36)				
10		.55 (.33)				
11		.46				
12		.42				
13		.90 (.72)				
14		.76 (.33)				
15			.82 (-.65)			
16			.57 (-.72)			
17			.53 (-.49)			
18			.50 (-.74)			
19			.35 (-.41)			
20 (NEW)			--			
21 (NEW)			-- (-.78)			
22				.78 (-.43)		
23				.48		
24				.43		
25				.78 (-.77)		
26				.58 (-.73)		
27				-.55 (.35)		
28				.42 (-.76)		
29					.81	
30					.78	
31					-.37	
32 (NEW)					-- (-.54)	
33 (NEW)					--	
34 (NEW)					--	
35 (NEW)					-- (-.51)	

*Where possible, two factor loadings are reported for each item. Factor loadings in parentheses are those obtained by the present cross-validation. Those items receiving less than .30 loading are not reported.

Table 3 (Continued)

ITEM	FACTOR I	II	III	IV	V	VI
36						-.76 (.43)
37						-.51 (.56)
38						-.40
39						-.37
40						-.35 (.72)
41 (NEW)						--
42 (NEW)						-- (.82)

The Organizational Climate Description Questionnaire. This instrument, developed in 1963 by Halpin and Croft, is comprised of sixty-four items to which responses are given on a four point scale. By administering the instrument to all the teachers in an elementary school, scores are computed along the eight subtest dimensions. Individual teacher scores are averaged to derive a school score for each variable; these school means are then converted to normatively standardized scores by comparison with the national sample. Finally, climate similarity scores are determined for each school by comparisons of subtest loadings with six prototypic profiles of open, autonomous, controlled, familiar, paternal and closed climates. The present investigation was limited to the use of the subtest scores.

Andrews (1965) and Stansbury (1968) both recently reported similar findings that the OCDQ subtest scores as Andrews wrote (1965): ". . . it is concluded that the subtests of the Organizational Climate Description Questionnaire provide reasonably valid measures of important aspects of the leadership of the school principal in a perspective of interaction with his staff."

Although Hayes (1972) very recently reported many serious implications regarding necessary revisions required to the OCDQ for future use, the present paper does not take these recent findings into account. Adjustments in these findings will be warranted particularly with the Aloofness dimension in relation to the Production Emphasis, and in particular with the consideration in relation to Intimacy. These adjustments will not appear to affect seriously the findings of the present study, however.

The OCDQ data for each of the sampled schools was transferred from optical scanning answer sheets onto computer cards, mailed to the Education Research Laboratory at the University of Georgia, scored and returned for use in the current research.

Preparation of the Data

Environment variables. Student responses to the Elementary School Environment Survey were transferred from optical scanning sheets to computer cards. The percentage of keyed student responses was determined for each item, school by school. Items were then grouped according to their subtest designation. Next, individual item scores within each subtest grouping were averaged to obtain variable scores for each school. This procedure provided a percentage score for all schools on each environmental variable; thus, each variable score represents the percentage of responding students who perceived their school's educational environment in the keyed direction. The six environmental scores for each school are depicted in Table 4, in addition to means and standard deviations for each variable. A frequency distribution of school scores for each variable was prepared after converting each factor score into standard score equivalents. All distributions approximated normal curves.

Principal and teacher variables. Teacher responses to the Organizational Climate Description Questionnaire were transferred to computer cards and scored. Returned output for each school included normatively standardized scores on the four principal variables and four teacher variables. These school scores are presented in Table 5. Next, a frequency distribution of school scores for teacher and principal variables was obtained by converting each factor score to its standard score equivalent. These distributions also approximated normality.

The elementary environment variable scores and teacher-principal variable scores were prepared for further analysis.

Relationships Between Groups of Variables

The general relationship between educational environment variables and teacher-principal variables was tested by means of canonical correlation. Canonical correlation expresses, in a single index, the interrelationship between two sets of multiple variables. Other more

Table 4

Educational Environment Scores

SCHOOL NUMBER	Factor					
	ALIENATION	HUMANISM	AUTONOMY	MORALE	OPPORTUNISM	RESOURCES
000	37.0	42.4	47.7	42.8	47.2	58.9
001	28.7	55.2	50.1	57.9	45.7	72.0
002	26.7	63.4	45.7	62.7	41.2	73.0
003	34.9	58.0	46.8	51.8	41.4	66.3
004	22.8	57.7	59.6	60.2	44.7	85.0
013	31.0	50.9	59.9	52.3	46.0	75.7
014	36.4	50.7	61.6	43.8	47.9	68.3
100	23.5	57.4	61.8	60.9	43.6	74.1
101	45.4	45.0	67.4	42.6	54.2	66.1
102	46.6	45.2	60.2	40.8	45.6	64.8
103	35.5	53.9	44.2	48.9	47.1	63.2
110	41.3	43.8	52.4	42.1	47.0	64.0
112	22.4	57.2	61.4	63.5	47.8	68.1
114	33.8	48.8	51.9	47.9	45.1	68.6
121	32.0	49.3	44.2	43.3	45.3	61.5
200	32.8	53.8	45.9	47.7	46.6	47.4
202	44.2	43.7	49.1	39.7	41.4	54.7
203	35.2	46.1	55.4	48.9	45.2	58.7
212	26.6	54.3	43.0	67.7	43.0	65.9
213	22.5	61.0	32.8	63.9	41.5	61.4
300	29.4	53.1	62.4	50.6	48.1	74.2
301	29.8	56.8	47.9	51.2	46.3	62.5
304	30.9	49.1	67.9	45.9	48.7	64.3
311	27.1	52.9	58.0	44.4	44.6	73.9
313	32.0	50.2	63.4	50.2	51.5	71.6
330	26.7	59.0	40.6	66.1	42.3	78.6
331	37.4	48.8	60.4	44.8	44.5	75.4

Table 4 (Continued)

SCHOOL NUMBER	Factor ALIENATION	HUMANISM	AUTONOMY	MORALE	OPPORTUNISM	RESOURCES
332	29.9	49.8	53.2	47.7	47.0	73.6
333	34.0	51.9	46.4	52.6	43.7	67.9
342	23.4	57.7	50.0	54.7	43.0	73.3
343	31.8	50.4	49.1	48.0	48.6	72.9
400	38.3	50.2	49.3	47.7	42.0	54.5
410	30.9	47.7	48.0	62.5	45.8	61.3
411	34.1	51.6	70.5	53.8	49.3	69.6
420	36.9	45.2	54.2	51.8	48.6	61.7
422	37.8	38.8	64.4	47.2	48.8	65.6
MEAN SCORES	32.5	51.4	53.5	51.4	45.8	67.1
STANDARD DEVIATIONS	6.3	5.6	8.7	7.7	3.0	7.5

Table 5

Teacher-Principal Interaction Scores

SCHOOL NUMBER	Teacher Variables				Principal Variables			
	DIS.	HIND.	ESP.	INT.	ALOOF.	PRO.	THRUST	CONSID.
000	53	50	38	45	49	39	41	42
001	51	48	51	49	50	47	56	53
002	46	46	53	55	50	47	52	55
003	49	47	53	47	49	50	56	50
004	46	44	57	60	56	47	56	55
013	54	51	45	49	46	47	48	50
014	57	57	42	45	48	53	35	37
100	53	45	45	58	46	44	48	49
101	59	54	44	53	44	48	45	48
102	50	58	43	56	55	53	32	39
103	53	54	46	52	45	46	49	42
110	53	55	47	50	50	51	54	53
112	46	43	57	53	45	43	49	53
114	59	49	46	55	51	52	41	48
121	57	57	42	45	52	47	39	41
200	51	56	35	54	48	40	52	53
202	63	61	38	55	47	48	28	37
203	58	46	50	57	53	47	46	48
212	47	48	43	43	50	52	52	48
213	44	42	55	49	56	49	53	44
300	46	53	53	53	60	51	52	47
301	45	48	57	57	55	45	51	52
304	53	58	48	50	47	44	52	48
311	46	45	51	52	45	44	42	44
313	50	51	49	45	47	45	40	37
330	51	47	46	53	54	47	45	46

Table 5 (Continued)

SCHOOL NUMBER	Teacher Variables				Principal Variables			
	DIS.	HIND.	ESP.	INT.	ALOOF.	PRO.	THRUST	CONSID.
331	60	53	48	47	52	43	52	55
332	52	47	46	47	55	40	38	46
333	61	51	39	50	56	50	31	43
342	54	50	55	53	48	40	50	49
343	54	57	51	49	52	52	40	45
400	52	48	45	46	50	50	50	40
410	48	43	51	60	49	51	48	51
411	55	52	49	53	43	43	40	46
420	55	44	51	57	51	47	56	57
422	51	50	49	49	47	47	31	37
MEAN SCORES	52.3	50.2	47.7	51.4	50.0	46.9	45.8	46.9
STANDARD DEVIATIONS	4.9	5.0	5.6	4.6	4.0	3.9	7.9	5.7

common multivariate techniques, such as multiple regression, assume a single criterion variable and a multivariate set of predictors. Mathematically, the canonical correlation between two sets of measurements is the maximum correlation between linear functions of the two sets of variables. As expressed by Dunteman and Bailey (1967), "canonical correlation involves finding the linear combination of one set of variables and the linear combination of a second set of variables that will result in a maximum correlation between the two linear functions." The BMD06M Biomedical Computer Program (Dixon, 1965, pp. 207-214) was used to compute three separate canonical correlations. First, the set of principal variables (aloofness, production emphasis, thrust, consideration) was correlated with the set of teacher variables (disengagement, hindrance, esprit, intimacy). Second, the set of teacher variables was correlated with the set of educational environment variables (alienation, humanism, autonomy, morale, opportunism, and resources). Third, the set of principal variables was correlated with the set of educational environment variables. Coefficients, or weights, were determined for all variables in each relationship. These weights produced the maximum possible correlation between the two sets of variables under consideration. Early investigators were primarily interested in deriving the maximum canonical correlation corresponding to the best linear combination of the two sets of variables under consideration. Cooley and Lohnes (1962, p. 37) note that recent research has shown that other linear combinations may also be of importance. Computationally, a "second best," "third best," etc. linear combination is determined, each possessing its associated canonical correlation coefficient.

The significance of each canonical correlation was tested according to procedures outlined by Bartlett (1941, 1947) and described by Cooley and Lohnes (p. 37). In general, with r roots removed, Lambda was defined:

$$\Lambda = \prod_{i=r+1}^{q} (1 - \lambda_i), \quad q < p,$$

where λ_i represents the latent root removed and p and q represent the number of predictor and criterion variables, respectively. The following χ^2 approximation was then used for the distribution of Λ with (p-r) (q-r) degrees of freedom:

$$\chi^2 = -[N - .5\ (p + q + 1)] \log_e \Lambda$$

Tables 6, 7 and 8 summarize the results of the three canonical correlations.

Table 6

Canonical Correlation Between the Set of Principal Variables and the Set of Teacher Variables:

χ^2 Tests of Successive Latent Roots

ROOTS REMOVED	LARGEST LATENT ROOT REMAINING	CANONICAL R	Λ	χ^2	df	p
0	$\lambda_1 = .360$	.60	.412	27.9	16	<.05
1	$\lambda_2 = .336$	.58	.643	13.9	9	>.10
2	$\lambda_3 = .026$	.16	.970	.95	4	>.10
3	$\lambda_4 = .004$	.06	.996	.13	1	>.10

Table 7

Canonical Correlation Between the Set of Teacher Variables and the Set of Educational Environment Variables:

χ^2 Tests of Successive Latent Roots

ROOTS REMOVED	LARGEST LATENT ROOT REMAINING	CANONICAL R	Λ	χ^2	df	p
0	$\lambda_1 = .578$	.76	.245	43.1	24	<.01
1	$\lambda_2 = .260$	.51	.584	16.4	15	>.10
2	$\lambda_3 = .130$	.36	.791	7.1	8	>.10
3	$\lambda_4 = .0900$	.30	.910	2.86	3	>.10

Table 8

Canonical Correlation Between the Set of Principal Variables and the Set of Educational Environment Variables:

χ^2 Tests of Successive Latent Roots

ROOTS REMOVED	LARGEST LATENT ROOT REMAINING	CANONICAL R	Λ	χ^2	df	p
0	$\lambda_1 = .372$	.61	.325	34.3	24	<.10
1	$\lambda_2 = .260$	.51	.517	20.1	15	>.10
2	$\lambda_3 = .240$	.49	.700	10.9	8	>.10
3	$\lambda_4 = .078$	.28	.922	3.5	3	>.10

The relationship between principal variables and teacher variables. The maximum canonical correlation between the set of principal variables and the set of teacher variables was .60, which was significant beyond the .05 level. Thus, there is at least one significant way in which these two sets of variables are related. No further significant combinations seemed to exist.

The contributions of individual variables to the significantly related canonical variates is displayed in Table 9 . The loadings reveal that principal behaviors of Thrust and Consideration provide the major contribution to the relationship, while the primary teacher variables were Disengagement and Intimacy.

Table 9

Resulting Weights from Canonical Correlation of Four Principal Behaviors with Four Teacher Behaviors

($R = .60$, $p < .05$)

Principal Behavior Weights		Teacher Behavior Weights	
-1.53	Thrust	.74	Disengagement
1.10	Consideration	.53	Intimacy
- .29	Aloofness	-.30	Esprit
.16	Production Emphasis	.02	Hindrance

The relationship between teacher variables and educational environment variables. The maximum canonical correlation between the set of teacher variables and the set of educational environment variables was .76. This correlation, beyond the .01 level of significance, indicates that these two sets of variables are related in at least one highly significant way. No further significant combinations were obtained.

The assignment of weights to each variable involved in the significant canonical relationship is depicted in Table 10. Inspection of this table reveals the importance of the teacher variables of Hindrance and Disengagement, while the environmental features of Morale and Alienation seem to be primary contributors to the canonical relationship.

Table 10

Resulting Weights from Canonical Correlation of Four Teacher Behaviors with Six Educational Environment Features

(R = .76, p < .01)

Teacher Behavior Weights	Environmental Variable Weights
.78 Hindrance	-.75 Morale
.35 Disengagement	.48 Alienation
.02 Esprit	.18 Humanism
-.005 Intimacy	.09 Resources
	.05 Opportunism
	-.04 Autonomy

The relationship between principal variables and educational environment variables. The maximum canonical correlation between the set of principal variables and the set of educational environment variables was .61. The chi square test of significance revealed that this correlation was significant beyond the .10 level. At this level of significance, there is at least one important way in which the two sets of variables are related.

Examination of Table 11 reveals that the primary contributors to the relationship were the principal behaviors of Thrust and Production Emphasis and the educational environment variable of Alienation.

Table 11

Resulting Weights from Canonical Correlation of Four Principal Behaviors with Six Educational Environment Features

(R = .61, p < .10)

Principal Behavior Weights		Environmental Variable Weights	
-.99	Thrust	1.23	Alienation
.80	Production Emphasis	.63	Morale
.58	Consideration	.55	Resources
-.21	Aloofness	-.48	Humanism
		-.24	Opportunism
		-.06	Autonomy

Bivariate Relationships

Specific bivariate hypotheses were tested by obtaining the Pearson product-moment correlations between isolated teacher-principal variables and selected educational environment variables. In addition, analysis of the canonical correlations indicated the several specific principal-teacher and educational environment variables deserved special attention. Product-moment correlations between environment variables and teacher-principal variables were generated by use of the Nonparametric Statistical System (NPAR) computer program, developed by the Computer Institute for Social Science Research. The intercorrelations and their associated significance levels are presented in Table 12.

Testing of priority hypotheses. Five priority hypotheses for the present investigation were developed after examining pertinent research findings and data from a pilot study. These hypotheses are restated below.

H_1: There will be a significant negative relationship between the Aloofness of the principal and Alienation in the educational environment.

H_2: There will be a significant positive relationship between the Thrust of the principal and Morale in the educational environment.

H_3: There will be a significant positive relationship between the Disengagement of the teachers and Alienation in the educational environment.

Table 12

Pearson Product-Moment Correlations Between
Educational Environment Variables and
Teacher-Principal Variables*

VARIABLES OF THE EDUCATIONAL ENVIRONMENT		TEACHER VARIABLES				PRINCIPAL VARIABLES			
		Dis.	Hind.	Esprit	Intim.	Aloof.	Pro.Emp.	Thrust	Con.
Alienation	r =	.5794	.6122	-.5323	-.0996	-.1384	.2833	-.4308	-.3624
	p =	.0002	.0001	.0006	.5518	.4702	.0848	.0070	.0254
Humanism	r =	-.5340	-.4441	.4593	.1207	.1586	-.1031	.4994	.3707
	p =	.0006	.0052	.0038	.4702	.3416	.5380	.0014	.0220
Autonomy	r =	.1695	.2074	.0757	.1174	-.3619	-.1294	-.1723	-.0319
	p =	.3090	.2116	.6512	.4826	.0256	.6388	.3008	.8492
Morale	r =	-.5457	-.7090	.4575	.2068	.1132	.0194	.4439	.4065
	p =	.0004	.0001	.0038	.2130	.4986	.9080	.0052	.0114
Opportunism	r =	.1318	.2875	-.0479	-.0537	-.2960	-.1204	-.1451	-.0770
	p =	.4304	.0802	.7752	.7490	.0722	.4714	.3846	.6460
Resources	r =	-.1815	-.2569	.4475	.0495	.1547	-.0070	.1002	.2242
	p =	.2754	.1196	.0048	.7678	.3538	.9666	.5496	.1760

*Two scores are reported for each relationship: Pearson r and significance level p, for a two-tailed test.

H_4: There will be a significant positive relationship between the Hindrance of the teachers and Alienation in the educational environment.

H_5: There will be a significant negative relationship between the Disengagement of the teachers and Morale in the educational environment.

Pearson product-moment correlations and significance levels for each priority hypothesis are highlighted in Table 13.

Table 13

Pearson Product-Moment Correlations for Priority Hypotheses

	Hypotheses				
	H_1	H_2	H_3	H_4	H_5
Pearson r	-.14	.44	.58	.61	-.55
Significance level p*	NS	.005	.0002	.0001	.0004

*Two-tailed test. Significance levels p > .10 are marked NS.

Four of the five hypotheses (H_2, H_3, H_4, H_5) were highly significant. Of particular interest were the extremely high correlations for all three hypotheses involving teacher variables. Disengagement and Hindrance behavior were both found to be highly related to Alienation in the educational environment, while Disengagement was found to be highly related to Morale in the educational environment. A significant relationship was also found between the Thrust of the principal and Morale in the educational environment. Even though it is not possible to infer causal

relationships from correlational findings such as these, it is felt that the four significant findings reported above warrant special attention in future research of a more experimental nature.

Testing of plausible hypotheses. Eight additional hypotheses were developed for the present investigation, derived solely from the findings of the pilot study. These plausible hypotheses are restated below.

H_6 : There will be a significant positive relationship between the Consideration of the principal and Resources in the educational environment.

H_7 : There will be a significant positive relationship between the Thrust of the principal and Resources in the educational environment.

H_8 : There will be a significant positive relationship between the Aloofness of the principal and Resources in the educational environment.

H_9 : There will be a significant negative relationship between the Intimacy of the teachers and Resources in the educational environment.

H_{10} : There will be a significant negative relationship between the Hindrance of the teachers and Resources in the educational environment.

H_{11} : There will be a significant negative relationship between the Production Emphasis of the principal and Opportunism in the educational environment.

H_{12} : There will be a significant negative relationship between the Disengagement of the teachers and Opportunism in the educational environment.

H_{13} : There will be a significant negative relationship between the Hindrance of the teachers and Humanism in the educational environment.

Pearson product-moment correlations for these specific hypotheses are highlighted in Table 14.

Table 14

Pearson Product-Moment Correlations
for Plausible Hypotheses

	Hypotheses							
	H_6	H_7	H_8	H_9	H_{10}	H_{11}	H_{12}	H_{13}
Pearson r	.22	.10	.15	.05	-.26	-.12	.13	-.44
Significant level p*	NS	NS	NS	NS	NS	NS	NS	.005

*Two-tailed test; Significance levels p > .10 are marked NS.

The only significant finding regarded the negative relation between the Hindrance of the teachers and Humanism in the educational environment. It was of particular interest to note the lack of significant findings for those hypotheses involving the environmental variable of Resources. Even though the results of the pilot study provided the basis for stating five plausible hypotheses between Resources and selected teacher-principal variables, none attained significance in the present inquiry.

Bivariate relationships suggested by Canonical Variate Weights. Canonical correlation analysis reported in a previous section revealed that the variables of Thrust and Alienation supplied the highest contribution to the canonical relationship between the principal's behavior and the educational environment. It was consequently decided to examine additional bivariate correlations, using first the principal behavior of Thrust and then the environment variable of Alienation. This examination

(see Table12) revealed the following significant relationships between teacher-principal and environmental variables, in addition to those already reported.

> There was a significant (p = .007) negative relationship between the Thrust of the principal and Alienation in the educational environment.
>
> There was a significant (p = .001) positive relationship between the Thrust of the principal and Humanism in the educational environment.
>
> There was a significant (p = .025) negative relationship between the Consideration of the principal and Alienation in the educational environment.
>
> There was a significant (p = .001) negative relationship between the Esprit of the teachers and Alienation in the educational environment.

An examination of the canonical correlation between teacher variables and environment variables revealed that Hindrance and Disengagement were primary contributors to the relationship. A study of the environmental variables (see Table 12) associated with these two teacher behaviors revealed the following additional significant relationships.

> There was a significant (p = .001) positive relationship between the Disengagement of the teachers and Humanism in the educational environment.
>
> There was a significant (p = .0001) negative relationship between the Hindrance of the teachers and Morale in the educational environment.

Other bivariate relationships. Further examination of the correlation matrix (see Table 12) revealed six additional significant bivariate relationships between teacher-principal and educational environment variables.

> There was a significant (p = .026) negative relationship between the Aloofness of the principal and Autonomy in the educational environment.

There was a significant ($p = .02$) positive relationship between the Consideration of the principal and Humanism in the educational environment.

There was a significant ($p = .011$) positive relationship between the Consideration of the principal and Morale in the educational environment.

There was a significant ($p = .004$) positive relationship between the Esprit of the teachers and Humanism in the educational environment.

There was a significant ($p = .004$) positive relationship between the Esprit of the teachers and the Morale in the educational environment.

There was a significant ($p = .005$) positive relationship between the Esprit of the teachers and Resources in the educational environment.

In all, a total of seventeen significant bivariate correlations were obtained by computing the Pearson product-moment correlation between the teacher-principal variables and educational environment variables. The environment variables of Alienation, Humanism and Morale were involved in fifteen of the seventeen relationships. Thrust and Consideration behavior accounted for all but one of the seven significant relationships involving the principal, while significant correlations were obtained for all teacher variables except Intimacy.

Since correlational investigations are concerned only with the degree of relation of two variables, it is not possible to suggest cause and effect inferences from the bivariate findings reported above. For example, the finding of a significantly high correlation between Disengagement and Alienation does not enable us to conclude that the Disengagement of the teachers causes students to perceive Alienation in the educational environment. However, the correlational findings do provide indications of useful starting points for experimental research.

into possible causal relationships. For school personnel, it should be particularly useful to know that it is possible to examine school conditions such as Alienation, Humanism, and Morale, and that these features are highly related, in unique directions, to specific teacher and principal behaviors such as Disengagement, Hindrance, Esprit and Thrust.

Summary

One primary intent of the present study was to document the relationship between the behavior of the school principal, his staff, and the educational environment of selected elementary schools. The overall relationship of these sets of variables was tested by means of canonical correlations. As anticipated, a high degree of relationship was discovered between the behavior of teachers and the educational environment. In addition, the set of principal variables was significantly related to the set of teacher variables. Further, the behavior of the school principal was found to be related to the set of environment variables, though only at the $p < .10$ level of significance. Findings of the canonical analysis provided sufficient evidence to warrant the following conclusions:

1. The set of teacher variables was significantly related ($p < .01$) to the set of educational environment variables.

2. The set of principal variables was significantly related ($p < .05$) to the set of teacher variables.

3. The set of principal variables was significantly related ($p < .10$) to the set of educational environment variables.

The above findings indicated that specific bivariate relationships should be explored. Priority hypotheses for the present study were also tested. All bivariate relationships were examined by the computation of Pearson product-moment correlations. Inspection of the resulting correlation matrix revealed seventeen significant relationships between teacher-principal variables and educational environment variables.

Major findings of the bivariate analysis are summarized as follows:

1. The principal behaviors of Thrust ($p < .01$) and Consideration ($p < .05$) were related to Alienation (-), Humanism (+), and Morale (+) in the educational environment.

2. The teacher behaviors of Disengagement and Hindrance were significantly related ($p < .01$) to the educational environment variables of Alienation (+), Humanism (-), and Morale (-).

3. The teacher behavior of Esprit was significantly related ($p < .01$) to Alienation (-), Humanism (+), Morale (+), and Resources (+) in the educational environment.

4. The age of the principal and the number of years he has been in education were significantly related ($p < .05$) to Alienation (-), Humanism (+), Autonomy (-), and Morale [(+)$p < .10$] in the educational environment.

Implications for future research. As Campbell and Stanley suggest (p. 64), the determination of correlational relationships between selected phenomena is a useful prelude to experimental research. The many significant relationships discovered in the present study should consequently be used in further research of a more experimental nature. It is hoped, for example, that research could be designed to test causal relationships between components of teacher-principal interaction and the educational environment. While selection of hypotheses for such experimental study is primarily the task of future researchers, it would be useful to begin with specific findings of the present investigation. In particular, the significant relationships discovered for the four priority hypotheses should be examined through an experimental study. The inclination of the present researcher is to consider specific teacher-principal behaviors as dependent variables, and environment features as independent variables. The following hypotheses are suggested for future experimental research.

1. There will be a significant, positive, causal relation between the Thrust of the principal and Morale in the educational environment.

2. There will be a significant, positive, causal relation between the Disengagement of teachers and Alienation in the educational environment.

3. There will be a significant, positive, causal relation between the Hindrance of teachers and Alienation in the educational environment.

4. There will be a significant, negative, causal relation between the Disengagement of teachers and Morale in the educational environment.

The present investigation has demonstrated the utility of the technique of canonical correlation. In modern educational research, it

is often difficult to isolate single dependent variables. Frequently a wiser approach would be to examine relationships between sets of multiple variables. Canonical correlation provides a useful statistical tool for this type of research. Also, through continued use of the technique, methods should evolve to both use and interpret results more adequately. One particular implication for future research deserves special note. As may be recalled from an earlier section, three separate canonical correlations were obtained:

1. The relationship between the set of principal variables and the set of teacher variables.
2. The relationship between the set of teacher variables and the set of educational environment variables.
3. The relationship between the set of principal variables and the set of educational environment variables.

In analyzing these results, it would have been desirable to obtain a measure of the relationship between principal variables and educational environment variables, having removed the effect of the teacher variables. In the case of three isolated variables (X, Y, Z), this problem is easily resolved through the use of partial correlations. That is, the relation between X and Z can be determined, after removing the effect of Y. It was not clear whether a similar technique could be employed with canonical correlations. A study of recent developments regarding this problem revealed that no parallel technique was available for use with canonical correlations. Additional research on this problem could begin by extending and refining the procedures described recently by McDonald (1968, p. 351), who developed a generalized approach for obtaining weighted linear combinations of variables. These efforts are urgently

needed, especially since canonical correlation is likely to be increasingly useful in future educational research.

Another important consideration for additional research regards the stability and change of educational environments. The present investigation has provided a measure of the environment at a single, isolated point in time. It is likely that environmental features will vary somewhat from hour to hour, day to day, and year to year. Considerable more research is needed to determine the influence of these environmental fluctuations on both cognitive and affective areas of student growth and development. Are there times when environments tend to stabilize? Do different environments require different change strategies? A multitude of similar questions are of concern to those interested in improving the educational environment of schools.

Recommendations

The following set of recommendations is provided to both guide the efforts of future research and contribute to the improvement of educational programs.

1. An important next step in this research is to examine cause-and-effect relations between specific facets of the elementary principal's behavior and selected components of the educational environment. For example, a study could be developed to experimentally manipulate the principal variable of Thrust. By considering the environmental concerns of Alienation, Humanism, and Morale as independent variables, a pretest-post-test control

group design could be utilized to examine causal hypotheses.

2. A study should be conducted of psychometric properties of the Elementary School Environment Survey. Such a study could perform an item analysis using both the student and school as the experimental unit, examine the effect of slight word changes in certain items, and consider the entire issue of reliability of the subtests included in the instrument. Additional factor analysis is also warranted as an important phase of continuing research on the ESES.

3. Procedures should be developed to obtain ESES perceptions of those pupils enrolled in grades lower than five and six. The history of elementary school environment research is that perceptions of all fifth and sixth graders are used as the basis for deriving school environment scores. Additional methods should be explored in an attempt to obtain viewpoints more representative of the total student population. Research could be designed to compare questionnaire methods of gathering data with interview techniques and to determine the appropriateness of defining the school's student sample by random selection procedures.

4. Educational environment research is urgently needed at the secondary school level. Such phenomena as Alienation, Humanism, and Morale are critical in the survival of some high school programs. Thus, an important extension of the present investigation would be to examine the influence of the secondary school principal and his staff in relation to selected features of educational environment.

5. Those who plan to use the OCDQ as a research instrument should be aware of its shortcomings as well as its strengths. Since several studies have questioned the validity of the OCDQ as a measure of the "climate" of schools, it is recommended that use of the instrument be confined to the subtest scores. The present research has shown that the subtests do indeed provide a useful framework for the study of teacher-principal interaction.
6. Colleges, universities, and others responsible for the training of educational administrators should include the study of educational environments and organizational climates as part of their curricular offerings. It is particularly important that school administrators have experiences in examining the possible effect of their behavior on educational environments. Also, the tools of the present research could be readily adapted by principals as they guide evaluations and assessments of the effectiveness of educational programs.
7. As schools implement curricular changes and other innovations, careful determination of varying effects on educational environments seems necessary. For example, in a recent call for curriculum change, Sinclair (1970) proposed that educational programs be systematically formed in four curriculum segments (independent skills, individual inquiry, group awareness, and personalized continuum). Each of these segments is likely to possess unique environmental determinants. It will be important to maintain a perspective of environmental conditions

throughout the adoption and implementation of these and other attempts at educational change.

School leaders must more clearly comprehend the nature of their influence on the growth of the children they serve. Only then will it be possible to alter climates which discourage learning and build and maintain creative and stimulating educational environments for elementary youth.

REFERENCES and BIBLIOGRAPHY

Andrews, John H. M. "School Organizational Climate: Some Validity Studies." Canadian Education and Research Digest, Volume 5 (1965), 317-334.

Argyris, Chris. Personality and Organization. New York: Harper and Row, 1957.

Bartlett, M. S. "The Statistical Significance of Canonical Correlations." Biometrika, Volume 32 (1941), 29-38.

Brown, Robert John. Organizational Climate of Elementary Schools. Educational Research and Development Council of the Twin Cities Metropolitan Area, Monograph No. 2, Minneapolis, Minnesota, 1955.

Campbell, Donald T. and Stanley, Julian C. Experimental and Quasi-Experimental Designs for Research. Chicago: Rand McNally & Company, 1966.

Chesler, Mark; Schmuck, Richard; and Lippitt, Ronald. "The Principal's Role in Facilitating Innovation." Theory Into Practice, Volume 2, Number 5 (1963).

Cooley, William W. and Lohnes, Paul R. Multivariate Procedures for the Behavioral Sciences. New York: John Wiley & Sons, Inc., 1962.

Dixon, W. J. (Ed.). Biomedical Computer Programs. Los Angeles: University of California, 1965, 207-214.

Dunteman, George H. and Bailey, John P., Jr. "A Canonical Correlational Analysis of the Strong Vocational Interest Blank and the Minnesota Multiphasic Personality Inventory for a Female College Population." Educational and Psychological Measurement, Volume 27 (1967), 631-642.

Etzioni, Amitai. "Two Approaches to Organizational Analysis: A Critique and a Suggestion." Administrative Science Quarterly, Volume V (September, 1960), 257-278.

Feigl, Herbert. "Principles and Problems of Theory Construction in Psychology." in Current Trends in Psychological Theory. Pittsburgh: University of Pittsburgh Press, 1951, p. 182.

Getzels, Jacob W. "Administration as a Social Process." in Andrew W. Halpin, ed., Administrative Theory in Education. Chicago: Midwest Administration Center, University of Chicago, 1958, p. 157.

Goldhammer, Keith, et al. Issues and Problems in Elementary School Administration. Corvallis: Center for Research and Service, Oregon State University, 1970, p. 2.

Goodlad, John I. "The Setting." in The Principal and the Challenge of Change. Los Angeles: Institute for Development of Educational Activities, Inc., 1968, 5-9.

Gordon, C. Wayne. The Social System of the High School. Glencoe, Illinois, The Free Press, 1957.

Griffiths, Daniel E. Administrative Theory. New York: Appleton-Century-Crofts, Inc., 1959.

Gross, Neal and Herriott, Robert E. Staff Leadership in Public Schools: A Sociological Inquiry. New York: John Wiley & Sons, Inc., 1965.

Guy, P. Meade, II. "The Relationships Between Organizational Climate, Leadership, and Progress." Unpublished Ed.D. dissertation, Auburn University, 1969.

Hayes, Andrew. The OCDQ Revisited, paper presented at 1972 AERA convention

Halpin, Andrew W. Theory and Research in Administration. Toronto: Collier-MacMillan Canada, Ltd., 1966.

Halpin, Andrew W. and Croft, Donald B. The Organizational Climate of Schools. Chicago: Midwest Administration Center, 1963.

Herriott, Robert E. "The Influence of Teacher Behavior Upon Changes in Pupil Behavior: An Appraisal of Empirical Research." Mimeographed paper available from the Graduate School of Education, Harvard University, Cambridge, Massachusetts, 1960.

Herzberg, Frederick. Work and the Nature of Man. New York: World, 1966.

Hodgkinson, Christopher. "Organizational Influence on Value Systems." Paper presented at the American Educational Research Association Annual Meeting, Minneapolis, Minnesota, 1970.

Hoy, Wayne K. and Appleberry, James B. "Teacher-Principal Relationships in 'Humanistic' and 'Custodial' Elementary Schools." The Journal of Experimental Education, Volume 39, Number 2 (1970), 27-31.

Katz, Daniel and Kahn, Robert L. Social Psychology of Organizations. New York: John Wiley & Sons, Inc., 1966.

Keochakian, Simon V. "A Comparison of Responses to the Original and the Oppositely Stated Items of the Learning Atmosphere Attitude Scale." Unpublished Ed.D. dissertation, University of Massachusetts, 1970.

Lieberman, Ann. "The Effects of Principal Leadership on Teacher Morale, Professionalism and Style in the Classroom." Unpublished Ed.D. dissertation, University of California, Los Angeles, 1969.

Likert, Rensis. New Patterns of Management. New York: McGraw-Hill Book Company, Inc., 1961.

Likert, Rensis and Willits, J. M. Morale and Agency Management. Hartford, Connecticut: Life Insurance Agency Management Association, 1940.

Lorge, Irving. The Lorge Formula for Estimating Difficulty of Reading Materials. New York: Columbia University, Teachers College, 1959.

Lutjemeier, John Arthur. "Organizational Climate, Teachers' Interpersonal Needs, and Pupil-Pupil Relations in Elementary Schools." Unpublished Ed.D. dissertation, University of Houston, 1969.

McDonald, Roderick P. "A Unified Treatment of the Weighting Problem." Psychometrika, Volume 33, Number 3 (September, 1968), 351-381.

McKay, A. Bruce. Principals, Teachers, and Elementary Youth: Measurement of Selected Variables of Teacher-Principal Social Interaction and Educational Environment

Murray, Henry A. Explorations in Personality. New York: Oxford University Press, 1938.

Owens, Robert G. Organizational Behavior in Schools. Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1970.

Owens, Robert G. and Steinhoff, Carl R. "A Study of the Relationship Between the OCI and the OCDQ." Paper presented at the 1969 convention of the Educational Research Association of New York State, November 5-7, 1969.

Pace, C. Robert. Analysis of a National Sample of College Environments. Final Report, Project No. 5-0764, United States Department of Health, Education, and Welfare: Office of Education, Bureau of Research. Washington, D.C., 1967.

Pace, C. Robert. College and University Environment Scales: Technical Manual, Second Edition. Princeton: Educational Testing Service, 1969.

Pace, C. Robert and Stern, George G. "An Approach to the Measurement of Psychological Characteristics of College Environments." Journal of Educational Psychology, Volume 49 (1958), 269-277.

Reynolds, James A. "Innovation Related to Administrative Tenure, Succession and Orientation." Unpublished Ed.D. dissertation, University of Missouri, 1965.

Sadker, David G. "Schools as Seen By Children: A Factor Analytic Study of the Perceptions of Fifth and Sixth Grade Students Toward Elementary School Environments." Unpublished Ed.D. dissertation, University of Massachusetts, 1971.

Scott, William A. Values and Organizations. Chicago: Rand McNally, 1965.

Silberman, Charles E. Crisis in the Classroom. New York: Random House, 1970.

Sinclair, Robert L. "Curriculum Segments: Toward Making Curriculum Responsive to Human Differences." Unpublished paper, available from the author, School of Education, University of Massachusetts, Amherst, Massachusetts, 1971.

Sinclair, Robert L. "Elementary School Educational Environment: Measurement of Selected Variables of Environmental Press." Unpublished Ed.D. dissertation, University of California, Los Angeles, 1968.

Spain, Charles R.; Drummond, Harold D.; and Goodlad, John I. Educational Leadership and the Elementary School Principal. New York: Rinehart and Company, 1956.

Stansbury, Robert D. "A Validation Study of the Organizational Climate Description Questionnaire for Iowa Elementary Schools." Unpublished Ph.D. dissertation, University of Iowa, 1968.

Tharp, Roland G. and Metzel, Ralph J. Behavior Modification in the Natural Environment. New York: Academic Press, 1969, p. 47.

Wiggins, Thomas W. "Leader Behavior Characteristics and Organizational Climate." Unpublished Ph.D. dissertation, Claremont Graduate School at University Center, 1968.

APPENDIX A

DESCRIPTION OF TEACHER-PRINCIPAL INTERACTION VARIABLES

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Teacher's Behavior

I. Disengagement refers to the teachers' tendency to be "not with it." This dimension describes a group which is "going through the motions," a group that is "not in gear" with respect to the task at hand. It corresponds to the more general concept of anomie as first described by Durkheim. In short, this subtest focusses upon the teachers' behavior in a task-oriented situation.

II. Hindrance refers to the teachers' feeling that the principal burdens them with routine duties, committee demands, and other requirements which the teachers construe as unnecessary busy work. The teachers perceive that the principal is hindering rather than facilitating their work.

III. Esprit refers to "morale." The teachers feel that their social needs are being satisfied, and that they are, at the same time, enjoying a sense of accomplishment in their job.

IV. Intimacy refers to the teachers' enjoyment of friendly social relations with each other. This dimension describes a social-needs satisfaction which is not necessarily associated with task-accomplishment.

Principal's Behavior

V. Aloofness refers to behavior by the principal which is characterized as formal and impersonal. He "goes by the book" and prefers to be guided by rules and policies rather than to deal with the teachers in an informal, face-to-face situation. His behavior, in brief, is universalistic rather than particularistic; nomothetic rather than idiosyncratic. To maintain this style, he keeps himself—at least, "emotionally"--at a distance from his staff.

VI. Production Emphasis refers to behavior by the principal which is characterized by close supervision of the staff. He is highly directive, and plays the role of a "straw boss." His communication tends to go in only one direction, and he is not sensitive to feedback from the staff.

VII. Thrust refers to behavior by the principal which is characterized by his evident effort in trying to "move the organization." "Thrust" behavior is marked not by close supervision, but by the principal's attempt to motivate the teachers through the example which he personally sets. Apparently, because he does not ask the teachers to give of themselves any more than he willingly gives of himself, his behavior, though starkely task-oriented, is nonetheless viewed favorably by the teachers.

VIII. Consideration refers to behavior by the principal which is characterized by an inclination to treat the teachers "humanly," to try to do a little something extra for them in human terms. (Halpin, 1963, pp. 29, 32)

APPENDIX B

DESCRIPTION OF EDUCATIONAL ENVIRONMENT VARIABLES

DESCRIPTION OF EDUCATIONAL ENVIRONMENT VARIABLES

I. Alienation

A high score on this factor demonstrates a feeling of estrangement in the environment. This feeling of alienation could in fact lead to destructive acts perpetrated against the school itself.

Environments which score low on this factor reflect the presence of a student body which feels involved in school affairs. A sense of belonging is emphasized in this environment, and this sense of belonging is complemented by a concern for students. Students demonstrate their involvement by internalizing school norms in such areas as academic pursuits and obedience to school rules and regulations. The atmosphere is congenial and there is a cohesiveness and a sense of togetherness in this climate.

In conclusion, this factor, then, encompasses environmental characteristics such as the presence or lack of cohesion, concern, and a sense of involvement.

II. Humanism

The items in this factor reflect a concern for the value of the individual. It is a supportive climate that is marked by courtesy.

In addition, this value placed on the individual is carried over to his personal acts of expression, specifically aesthetic expression. This climate demonstrates a concern for creativity and it is supportive of poetry, music, painting and theatre.

A school characterized by this atmosphere is concerned with the integrity of the individual and a respect for his cultural and aesthetic expressions.

III. Autonomy

A high score on this factor suggests an environment which supports and encourages student independence. This climate suggests student initiative as well as autonomy. Emphasis on procedures and supervision are minimized. Self-direction rather than the obedience to rules of protocol is important. Individual differences, both in opinion and academic interests, are stressed. Another aspect of this environment is that the lines of communication between learners and teachers are open and candid.

This environment affords the student the opportunity to share in the responsibility for his own learning.

IV. Morale

The statements in this factor relate to student attitude towards the school. A high score on this factor indicates a friendly and cheerful school environment. This environment may be described as a happy one in which learners and teachers have a warm relationship.

A low score on this factor indicates a negative student attitude toward the school, and suggests poor relations between learners and teachers as well as disruptive student behavior.

This factor is concerned with student attitudes toward school, and the cooperating behavior which relates to such attitudes.

V. Opportunism

The items in this factor reflect an environment which is characterized by behavior which adapts to expediency or circumstance. A high score on this factor suggests a climate in which one gains social capital and academic status by behaving in an appropriate manner with important and powerful people. Informal political procedures and the importance of personal relationships are emphasized.

This environment seems to be categorized by entrepreneurial behavior and political maneuvering.

VI. Resources

The items in this factor reflect the number of optional learning opportunities available to and initiated for the students. The emphasis here is on the availability of in-class as well as extra-class resources. Included in this category are such resources as written materials, field trips, television, exhibits and music. The availability of firendliness of the teacher as a supporting service for learning is also included in this dimension. Schools which score high on this factor offer a variety of learning opportunities to learners. (Sadker, 1971)